

# **IQ Builder**

Catalog Number 26-1706

The logo is contained within a white rectangular border with rounded corners. The text is in a bold, sans-serif font, arranged in four lines: "Radio Shack" on the first line, "TRS-80" on the second, "MICRO" on the third, and "COMPUTER SYSTEM" on the fourth.


**Radio Shack  
TRS-80  
MICRO  
COMPUTER  
SYSTEM**

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CUSTOM MANUFACTURED IN THE USA FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

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*Note: Please read this Guide  
before you load the tape.*

# Introduction

## What Is IQ?

IQ is an acronym for “intelligence quotient.” Quotient is a number resulting from division. The intelligence quotient was calculated from the first IQ tests by dividing someone’s “mental age” by their chronological age. A child who had a chronological age of 10 and who scored the same as an average 12-year-old had an IQ of 12 divided by 10 then multiplied by 100, or 120. Similarly, a child with a chronological age of 8 who scored average for an 8-year old had an IQ of 8 divided by 8 multiplied by 100. This system was later dropped in favor of statistical calculations where the average score on an IQ test was set as 100. The name of the score is still called IQ even though it is not calculated from division of mental and chronological ages.

IQ tests are supposed to measure a person’s ability to learn. However, to do this the IQ test actually measures what a person has learned in the *past*. The idea is that if two people are exposed to the same experiences and one person learns more, that person is more intelligent. The flaw in this concept is that individuals are not likely to be exposed to the same experiences, especially if they come from different cultures or social backgrounds. However, IQ tests do work as crude measures of a person’s learning ability.

## What Do Tests Such As The SAT Measure?

Many of the same types of questions that appear on IQ tests also appear on aptitude tests such as the Scholastic Aptitude Test (SAT). IQ tests and aptitude tests measure many of the same things. The big difference between these two types of tests is the use to which each is put. The SAT is used as a predictor of how well a high school student is going to do in college. The test is designed specifically for this purpose. Evidence shows that the combination of grades, SAT scores, College Board Achievement Test scores and recommendations has proved to be an excellent, though not perfect, predictor of how well a high school student is going to do in college.

## **Introduction**

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Aptitude tests are divided into two separate abilities areas: verbal and mathematical, and two separate scores are usually reported when the tests are processed. Typical verbal aptitude questions are: synonyms and antonyms, analogies (word relationships), sentence completions and reading comprehension. Typical math aptitude questions often involve number series, data interpretation, data comparison, story problems, elementary algebra and elementary geometry.

### **How Does IQ Builder Help?**

Many people who have above-average intelligence do poorly on aptitude and IQ tests. One reason is that these individuals have not developed problem-solving skills needed to answer the types of questions found on these tests. The test taker must be able to analyze a question, separate it into its component parts, and then test a variety of answers to find the one that best fits the problem. The poor problem-solver does not follow any real plan of action. Instead he or she looks for an instant answer, or writes the first solution that comes to mind. On a multiple-choice test, the poor problem-solver usually jumps at the first answer that looks like it might be correct. In short, he or she panics and is unable to think through the problem at hand.

The *IQ Builder* series helps you to develop the problem-solving skills needed to do well on IQ and aptitude tests. Each of the courses in the series contains a group of lessons that help you with a specific category of questions. All of the courses will help you to develop your skills so you can handle even the most complex questions.

### **How Do I Begin To Use IQ Builder?**

Always begin with the first lesson in the course even if you think you know enough to skip ahead. There are several lessons on each side of the tape. Do the programs in order because each lesson builds on the one before. Repeat each lesson until you feel you can handle the examples in that lesson.

### **How Long Will A Lesson Take?**

You can make each session last as long as you wish. You can do each of the lessons in about 30 minutes.

## Test

There is a test at the end of each course. You can take the test after completing all the lessons — or earlier in the course — to see how well you can handle sample test questions.

## Loading And Using The Programs

1. Place the tape in the cassette recorder, and press the “PLAY” button.
2. Type **C L O A D**, and press **ENTER**.
3. When the READY appears again, type **R U N**, and press **ENTER**.
4. When you finish a lesson, the READY will reappear. To go to the next lesson, repeat the 3 instructions listed above. Use the tape counter to keep track of the location of each lesson. To repeat any lesson, rewind back to the counter number for that lesson.

### NOTE:

4K Level II machines do not have as much available memory as 4K Level I machines, therefore, some of the lessons have been slightly shortened to accommodate 4K Level II machines.

## Analogies

An analogy can be one of the toughest of verbal questions to handle because all of the meanings, connotations and uses of words have to be considered when answering the question. There are twenty-seven basic types of analogies. These basic types are discussed more fully on page 6. Here is a sample of an analogies question:

Big is to little as:

- (1) man is to men
- (2) dog is to cat
- (3) run is to walk
- (4) hot is to cold

A test taker must analyze the relationship between the words “big” and “little” and find the word pair that has the same relationship. Big and little are opposite extremes. Therefore the correct choice in (1), (2), (3) or (4) must also show opposite extremes. The best choice is (4) — hot is to cold. However, (3) might also be thought of as a sort of opposite. The key here is the phrase “best choice.” (4) is more of an opposite than (3).

## Analogies

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### Organization Of The Course

Side A of the tape cassette contains Lessons 1 to 4. Side B contains Lessons 5 and 6 plus a final test of your skill with analogies. Each lesson gives you the opportunity to work with as many or as few problems as you wish. For example, in Lesson 1 you can do anywhere from 1 to 30 problems at one sitting. You can start a lesson at any point you wish from problem 1 to problem 30. You could do problems 1 thru 10 on one day, and then do 10 thru 30 on the next. You may also find certain problems that you must do over several times before you get the “feel” of the problems.

### Lessons 1 And 2

In these lessons you must classify word pairs. This may prove to be a bit more difficult than some analogies problems themselves, but the practice will provide you with the ability to analyze almost any type of analogies problem. Here is a sample:

WRITER is to TYPEWRITER is what type of analogy?

- (1) worker to object created
- (2) person to goal
- (3) worker to tool
- (4) tool to object created
- (5) cause and effect

The correct answer is (3) worker to tool. Each of these lessons consists of 30 problems. An evaluation of your performance is given at the end of each session. It is recommended that you redo the lesson if you score below 60% correct, but you might also want to review the problems until you can easily score 90%.

### Lesson 3

Lesson 3 consists of 20 problems in the following form:

MOTHER is to DAUGHTER as FATHER is to:

- (1) boy
- (2) son
- (3) uncle
- (4) child
- (5) sibling

The answer to the above problem is (2) son.

If a mistake is made the program will give you a hint by first telling you what kind of analogy is shown in the problem. The program will give you a second hint if you wish. If you correctly answer the question on the second try, your correct response is worth only .7 of a correct answer. A second error will cause the program to give you the correct answer.

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### Lessons 4 And 5

Lessons 4 and 5 each consist of 15 questions of the following type:

KENNEL is to BULL TERRIER as:

- (1) dog is to cat
- (2) cage is to bird
- (3) cage is to green parrot
- (4) house is to man

The correct answer is (3) cage is to green parrot. The above problem is specific about the breed of dog kept in the kennel, so the correct matching word pair must also be specific about the breed of bird kept in a cage. Except for the form of the questions, these lessons work like Lesson 3.

### Lesson 6

This lesson is similar to the previous lessons except that the problems are presented in a different way:

EROSION : WATER :

- (1) ocean : wind
- (2) fog : travel
- (3) solid : liquid
- (4) aging : time
- (5) melt : heat

The answer is (5) melt : heat.

## Types Of Analogies

One way to analyze analogies is to reduce the relationship between the two words to a simple sentence. Here are some examples:

PAINTER is to BRUSH	A uses B in his or her work
DIAMOND is to GEM	A is an example of B
LITERATE is to READ	One who is A can do B
ILLNESS is to FEVER	A can cause B
PAUPER is to MONEY	A does not have B
BLINDERS is to VISION	A interferes with B
POLICE is to CRIMINALS	A protects us from B
FOUNDATION is to BUILDING	A supports B
SPRINT is to RUN	A is a more violent form of B

## Analogyes

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The above system is a good way to start to analyze word relationships, but you must do more. For example, how would you analyze DOG is to CAT? A chases B? A is bigger than B? A and B are are both pets? Any of these may be correct.

Another more precise way to analyze analogies is to classify the word pairs. Following is a list of our classes of word relationships:

TYPE 1 — part to whole

Examples: leg is to man  
wheel is to car  
lace is to shoe

TYPE 2 — type to one of its characteristics

Examples: skunk is to bad smell  
elephant is to large  
old car is to rusty

TYPE 3 — things that are part of the same thing

Examples: ears is to eyes (part of head)  
halfback is to center (part of a football team)  
branches is to leaves (part of a tree)

TYPE 4 — measurement to what is measured

Examples: pint to liquid  
meter to distance  
decibel to sound

TYPE 5 — measurement to object measured

Examples: pint to juice  
meter to cloth  
decibel to radio speaker

TYPE 6 — class to species

Examples: dog to greyhound  
insect to fly  
vehicle to truck

TYPE 7 — group to member

Examples: army to sergeant  
pack to wolf  
team to player

TYPE 8 — things in same class

Examples: truck to car (both vehicles)  
boxer to runner (both athletes)  
crow to robin

TYPE 9 – things with a feature in common

Examples: match to lightbulb (both give off light)  
clock to car (both have gears)  
bottle to lens (both made of glass)

TYPE 10 – measures of the same thing

Examples: pint to gallon (measures of liquid)  
pound to kilogram (measures of weight)  
goals to touchdowns (measures of score)

TYPE 11 – hierarchies

Examples: general to private  
president to congressman  
parent to child

TYPE 12 – cause and effect

Examples: hit to break  
fire to burn  
switch on to operate

TYPE 13 – things to what they do

Examples: cork to plug up  
soap to clean  
pencil to write

TYPE 14 – tools to material

Examples: saw to wood  
hammer to nail  
sewing machine to cloth

TYPE 15 – tools to what they create

Examples: potter's wheel to vase  
motor to power  
saw to cabinet

TYPE 16 – condition to what happens in that condition

Examples: storm to rain  
sick to fever  
happy to smile

TYPE 17 – worker to object created

Examples: carpenter to cabinet  
farmer to corn  
assembly worker to car



## Analogies

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TYPE 18 — worker to tool

Examples: carpenter to hammer  
mechanic to wrench  
surgeon to scalpel

TYPE 19 — person to goal

Examples: general to victory  
runner to 4-minute mile  
climber to mountain peak

TYPE 20 — person to something they avoid

Examples: child to the dark  
claustrophobic to a closed space  
general to defeat

TYPE 21 — synonyms and antonyms

Examples: dishonest to unethical (synonym)  
strong to weak (antonym)

TYPE 22 — things that go together

Examples: cup to saucer  
clouds to rain  
driver to car

TYPE 23 — a thing dependent on another thing

Examples: man to food  
fire to fuel  
health to clean air

TYPE 24 — a thing derived from another thing

Examples: metal to ores  
cell growth to protein  
cabinet to wood

TYPE 25 — a specific condition that occurs on/to  
a particular thing

Examples: wind to atmosphere  
rash to skin  
vibrate to violin string

TYPE 26 — opposing things or forces

Examples: electron to proton  
ying to yang  
Republicans to Democrats

TYPE 27 – words related by grammar

Examples: man to sky (both nouns)

blue to large (both adjectives)

Of course, some of these classifications overlap. Some word pairs will fit into several classifications. The idea is to pick the class that *best* fits the relationship.

Once you can categorize the relationships between word pairs, you can eliminate choices. However, when answering analogy-type questions, there may be more than one relationship involved, as shown in this example:

SELDOM is to FREQUENTLY as:

- (1) occasionally is to rarely
- (2) top is to bottom
- (3) never is to always
- (4) occasionally is to often

SELDOM is to FREQUENTLY is a type 21 relationship – that is, an antonym. These two words have opposite meanings. However, (2), (3) and (4) also are antonyms. Therefore the correct answer is based on an additional relationship.

*Seldom* and *frequently* are not absolutes. *Seldom* means that something can happen, but not too often. *Top* and *bottom*, and *never* and *always* are absolutes. The best choice here is (4), occasionally is to often.

*You are now ready  
to load the tape.*

### PROGRESS CHART

Student: \_\_\_\_\_

Lesson Number	Comments	Score

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## Number Series

The number series problem is a very common type of math question found on IQ tests. A number series problem gives you a list of numbers that are related by some rule. You must discover the rule to determine what the next two numbers in the series should be. Here's an example:

3 7 11 15 19 23 ? ?

The rule is: Add 4 to each number to get the next. So the next 2 numbers are  $23 + 4 = 27$  and  $27 + 4 = 31$

Of course, number series get much more complicated. The eight lessons in *Number Series* will help you develop the skill needed to analyze any number series problem.

## How To Use Number Series

Side A of the tape cassette contains Lessons 1 to 5. Side B contains Lessons 6 to 8 plus a final test of your skill with number series problems. Lesson 1 explains number series problems and shows several kinds of problems you will encounter. Lessons 2 to 8 are practice lessons. Each one presents 25 problems. Each lesson is more difficult than the one before. Lessons 7 and 8 contain problems as hard as any you'll find on an actual test.

## Instructions

After you load each lesson, just follow the instructions that appear on the TV monitor. Here's a summary of the instructions you'll follow in Lessons 2 to 8:

- First pick the series that you want to begin with. If you stopped in the middle of a lesson, pick up at that number the next time.
- Next you'll see a number series problem and try to type in the next 2 numbers in the series. Do it like this:

2 4 6 8 10 12 14 16

The next two numbers are:?

18,20

You type the two numbers, with a comma between them. Then press the ENTER or RETURN key.

- The computer tells you whether you're right or not and gives you another chance if you're wrong. You get three chances. If you make two mistakes on a problem, the computer gives you a hint. After your third mistake, the computer tells you the answer to that problem.
- After every problem you get a chance to stop the lesson and see your score.

### Methods For Solving Number Series

Here are some methods that may help you solve number series problems:

1. Read through the problem; you may see the pattern right away.

Example: 3 3 4 4 5 5 6 ? ?

The next 2 numbers are 6,7

2. Calculate the difference between each pair of numbers. Look for a pattern.

                  (-2) (+3) (-2) (+3)  
Examples: 5 ♦ 3 ♦ 6 ♦ 4 ♦ 7 ? ?

The rule is subtract 2, add 3. The next 2 numbers are: 5,8

                  (+1) (+2) (+3) (+4)  
                  1 ♦ 2 ♦ 4 ♦ 7 ♦ 11 ? ?

The amount of change increases by 1 each time.

The next 2 numbers are:  $11 + 5 = 16$ ,  $16 + 6 = 22$  or the next 2 numbers are: 16, 22

3. Look for alternating series (2 series combined in 1).

Example: 1 21 3 19 5 17 7 15 ? ?

The next number in the first series is 9. The next in the second series is 13. Answer – 9,13.

4. Look for groups of numbers within a series or other patterns if the above methods don't work.

Example: 1 2 3 11 12 13 21 22 ? ?

Each group of 3 numbers starts 10 greater.

Answer: 23,31

*You are now ready  
to load the tape.*

## Number Series

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### PROGRESS CHART

Student: \_\_\_\_\_

Lesson Number	Comments	Score

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## Vocabulary Builder

Most tests that measure a person's ability to use words include a section on word meanings. Tests such as the Scholastic Aptitude Test and other college entrance examinations have a large part of the test devoted to questions on word meaning.

There are several ways to test a person's understanding of word meanings. Vocabulary Builder I and II cover the two most common types of questions. The first type is the synonym question where you must find a word choice that means the *same* as a given word.

For example:

quick:      (1) fast   (2) hard   (3) silent  
                 (4) dishonest   (5) quiet

ANSWER: (1)

The second type deals with antonyms — words of opposite meaning. Here you must pick a word choice opposite in meaning from the given word. For example:

quick:      (1) fast   (2) slow   (3) silent  
                 (4) sandy   (5) loose

ANSWER: (2)

The tendency when answering antonyms is to forget that the correct answer is opposite in meaning. In this case the test taker mistakenly chooses the word that has the same meaning.

## How Is Vocabulary Builder Organized?

Vocabulary Builder is divided into Parts I and II, each on its own cassette. In each part Side A of the cassette contains five lessons of synonym questions. Side B contains five antonym lessons. Included on Side B is a sample vocabulary quiz that allows you to simulate taking an actual vocabulary test.

The vocabulary questions in Part II are significantly more difficult than those in Part I. Otherwise, the organization of the two sections is the same.

Each lesson gives you the opportunity to work with as many or as few problems as you wish. You can start anywhere from Question 1 to 40. You could do Questions 1 thru 10 on one day, and then 11 thru 40 on another.

### How To Use Vocabulary Builder

The idea of Vocabulary Builder is to give you practice answering the kinds of questions that may appear on aptitude tests. A single pass through a lesson may not be enough. You might have to take a lesson two or even three times to get the feel of the questions.

If you miss a question, you get several more chances to get the right answer. However, don't guess at random! If you miss a question twice, get a dictionary and look up the meaning of the words before attempting the question again.

One way to do well on vocabulary tests is to know the meanings of a lot of words! However, most people who do well on these tests do not necessarily know the meanings of all of the words on the test. What they do is analyze a word they do not know and figure out the word's meaning. Many of the more difficult words found on vocabulary tests are based on Latin and Greek words. Words can be classified and their meanings determined from a Latin or Greek root. Often the word in question will consist of a Latin or Greek root word with other parts added to give it a modern sound. For example, take the Greek word "chron" which means "time." From this root we get the following words:

CHRONOMETER: a very accurate clock

CHRONOLOGICAL: arranging events in order of time of occurrence

CHRONIC: lasting a long time

SYNCHRONIZE: to occur at the same time

CHRONICLE: a record of facts or events in order of time

In addition to the word root, word meanings can also be analyzed by prefixes and suffixes. For example, the prefix "trans-" means "across." Any word that begins with this prefix is going to have "across" in its definition.

TRANSATLANTIC: across the Atlantic Ocean

TRANSLATE: across one language to another

TRANSPIRE: "to breath across" — to turn out

TRANSMIT: broadcast across distance

*You are now ready  
to load the tape.*

## PROGRESS CHART

Student: \_\_\_\_\_

Lesson Number	Comments	Score





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## Important Information for Cassette Users

### Free Modification for LEVEL II Units

A modification that helps cassette loads in LEVEL II computers is available **free** to TRS-80 LEVEL II owners. This modification makes the volume setting less critical so that variations in different tapes usually will not require volume readjustments.

Some of the more recent LEVEL II Keyboard units have had this modification factory-installed. To see if the modification has been included in your computer, look at the catalog number on the bottom of the keyboard case. The modification has been made if the number ends in -1. For example, if the number is 26-1004-1, the modification has already been installed; if the number is 26-1004, the modification has not been installed.

If the number does not end in -1 and you have not already had the cassette modification installed by Radio Shack, you may arrange for installation at your local Radio Shack store.

### Using Your Cassette Deck

Many factors affect the performance of a cassette system. The most significant one is volume. Too low a volume may cause some of the information to be missed. Too high a volume may cause distortion and result in the transfer of background noise as valid information.

Three different cassette models have been supplied with the TRS-80 system — the CTR-40, CTR-41 and CTR-80. Each model has its own loading characteristics. The table below gives suggested volume ranges for each of the CTR models. Figures are for systems **without** the CLOAD modification.

Notice that volume ranges for LEVEL I and LEVEL II are different. This is because the LEVEL II data transfer rate is faster (500 baud vs. 250 baud). Also, notice that pre-recorded Radio Shack programs need a slightly **higher** volume setting than that required by your own CSAVED tapes. The pre-recorded tapes are produced with high-speed audio equipment at a slightly lower level than the CSAVE process provides.

RECORDER MODEL	USER-GENERATED TAPES		PRE-RECORDED RADIO SHACK TAPES	
	LEVEL I	LEVEL II	LEVEL I	LEVEL II
CTR-40	YELLOW LINE	RED LINE	YELLOW LINE	RED LINE
CTR-41	6 – 8	4 – 6	6½ – 8½	5 – 7
CTR-80	4½ – 6½	3 – 5	5½ – 7½	2½ – 5

Recommended Volume Settings for RADIO SHACK Cassette Decks

(With CTR-40 and CTR 80, to increase volume, turn the control to the left. With CTR-41, turn control to the right.)

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When information is being loaded from the cassette tape, two asterisks will appear on the screen. The one on the right will flash on or off each time a new line of data or program is read in. If the asterisks do not appear, or the one on the right does not flash, then the volume setting is probably too low. If the asterisks appear but one is not flashing, try increasing the volume setting. Use the reset button to stop the cassette and return control to you if loading problems occur.

Radio Shack programs are recorded at least twice on each tape (usually once on each side). You should do the same when you record programs on tape. This will give you a back-up if one does not load properly or if it becomes damaged.

**Important Note:** The CTR-41 requires that you keep the supplied “dummy plug” in the MIC jack at all times. However, the CTR-40 and the CTR-80 should never be used with the “dummy plug.”

### LEVEL I

Sometimes you will get an error message during an attempted CLOAD. This means that some information was lost or garbled. Adjust the volume level slightly and try again.

### LEVEL II

In case of an error message, proceed as above. In LEVEL II, there is also a rare case in which the program has not loaded correctly *even though no error is generated*. So, after CLOADing a program, be sure to LIST it. If some data was garbled, then at some point in the listing, the display will be filled with meaningless words and characters. Adjust the volume and try again.

## Hints and Tips

Computer tapes should be stored in a relatively dust-free area (a cassette case is recommended) and protected from high temperatures. Magnetic and electrical fields may alter recorded information, so avoid them (i.e. household appliances, power sources such as transformers and television sets, etc.).

The cassette deck supplied with the TRS-80 is very compatible with the system and will perform its duties with great success. To keep the cassette deck in top condition and thus minimize your problems, you should periodically perform some routine maintenance on it. Dirty heads can cause as much as a 50% loss in volume. Also, heads become magnetized with use and may cause distortion. We recommend that you clean the head, capstan and pinch roller after every four hours of operation. Heads on new recorders should always be cleaned before use.

**Note:** Cassette cleaning and demagnetizing accessories are available from your local Radio Shack store.

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### IMPORTANT NOTICE

ALL RADIO SHACK COMPUTER PROGRAMS ARE DISTRIBUTED ON AN "AS IS" BASIS WITHOUT WARRANTY

Radio Shack shall have no liability or responsibility to customer or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by computer equipment or programs sold by Radio Shack, including but not limited to any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use or operation of such computer or computer programs.

NOTE: Good data processing procedure dictates that the user test the program, run and test sample sets of data, and run the system in parallel with the system previously in use for a period of time adequate to insure that results of operation of the computer or program are satisfactory.

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